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The Macrosecuritization of Antimicrobial Resistance in China

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Abstract

The global spread of antimicrobial resistance (AMR) is an existential threat to humanity, one that has generated a macrosecuritizing response by states and international organizations. Since the turn of the century, China has been a source of numerous infectious disease outbreaks. It is also the origin of the MCR-1 gene, which confers resistance to colistin, a “last-line” antibiotic deployed against multidrug-resistant infections. With the largest population in the world, coupled with its status as a major supplier of agricultural produce, evaluating Chinese responses to AMR is critical to understanding the efficacy of the global response. Drawing on knowledge of both Chinese politics and health security, this article analyzes how Chinese actors have responded to the threat in the public and animal health sectors as well as the domestic and international implications of these responses. Based on interviews with key Chinese and international officials, scientists, and public health specialists, as well as farmers and consumers, we argue that the securitization of AMR in China is currently more concerned with domestic policy and resource competition than with addressing the existential health threat. Without a greater alignment of AMR strategies within China, macrosecuritizing efforts to address the threat globally cannot succeed.

Keywords: China, disease, antimicrobial resistance, securitization

Introduction

Antimicrobial resistance (AMR) denotes the ability of microbes to become resistant to antimicrobial drugs. Although the threat posed by resistance to antibiotics is almost as old as their use, it is only now that AMR is garnering global attention. The World Health Organization’s (WHO) first global report on AMR surveillance (World Health Organization 2014, IX) summarized the scope of the threat, stating that, “A post-antibiotic era—in which common infections and minor injuries can kill—far from being an apocalyptic fantasy, is instead a very real possibility for the 21st Century.” Unlike other newly emergent diseases—severe acute respiratory syndrome (SARS), Influenza A virus subtype H5N1, Mid-

dle East respiratory syndrome coronavirus (MERS CoV), and the Zika virus—which all originated in a particular country, AMR is a truly global threat with novel outbreak sites in multiple countries.

Analyses of health security threats are frequently viewed through the lens of securitization (Elbe 2006, 2010; McInnes and Rushton 2013; Davies 2008; Curley and Herington 2011; Jin and Karackatta 2011). According to the model put forward by Buzan, Wæver, and de Wilde 1998, an existential threat is first identified and accepted by an audience before a series of resource reallocations and policy responses is undertaken (emergency mode processes and policies) to resolve it. At its heart, the model presupposes that the initial actions taken by

securitizing actors and agencies represent a rational attempt to resolve an existential threat to human existence. While the elements of this model have long been criticized—in terms of an overemphasis on the verbal nature of speech acts (Williams 2003; Möller 2007), the neglect of the role of audiences (Balzacq 2005; Vaughn 2009), or the Eurocentric nature of its agenda (Vuori 2008)—Buzan and Wæver (2009) have also observed that the theoretical and empirical space between the state and the global levels needs more attention.

In addressing this gap, Buzan and Wæver (2009, 256) extended the theoretical reach of the securitization model to include macrosecuritization, which is an “overarching securitization that relates, organizes and possibly subsumes a host of other middle-level securitizations.” Such umbrella forms of securitization can either impose hierarchies “on the lower level ones incorporated within them” or simply “bundle the other securitizations together without outranking them.” Given the multiplicity of actors and interests enveloped by macrosecuritizations, the structure of the process is more unstable than traditional forms of securitization. In particular, middle-level actors—and their attendant securitization processes—can become disaffected with their subordination to the higher-level process. Due to the global spread of infectious diseases and related health threats (such as AMR), the concurrent securitization responses provide valuable case studies wherein the conceptual utility of macrosecuritization can be evaluated (Lo and Thomas 2018).

A shortcoming with macrosecuritization is that it makes very realist assumptions as to the nature of the middle tier, whereby states are considered as units for analysis with insufficient power accorded to substate and subnational actors. By consciously not integrating lower-tier actors and processes into the macrosecuritization framework, we argue that the model has suboptimal theoretical utility. It is only by understanding the perceptions and behaviors of these actors that it is possible to ascertain whether an issue has been securitized or not. As will be shown later in this article, from a surface reading of Chinese responses to AMR it would be possible to conclude that a middle-tier securitization—one that is integrated into a macrosecuritization—has taken place. Chinese officials, state media, and bureaucracies have all committed speech acts to support global efforts to address the existential threat of AMR. This is supported by domestic policy and technical communities that have reallocated funds and developed new policies and practices to address AMR threats.

However, the findings from our fieldwork suggest that a conclusion based solely on these moves does not fully

capture the motivations of the securitization of AMR in China. The perception of AMR as an existential threat—one that requires immediate emergency responses—is not present at the subnational level. Instead, we argue that AMR has been securitized by national authorities to enforce central health policy control over subnational authorities, the general population, or local market actors. This is necessitated by the presence of competing lower-level policy and economic logics.

In making this argument, we propose to first contextualize the political-policy environment within which middle-tier securitizations take place. This follows Buzan and Wæver’s observation that we must “understand the tensions between overarching macrosecuritizations and the lower level securitizations that they contain and coordinate” and provides an initial contribution to answering how “macrosecritisations [are] affected when they have to incorporate a new lower level securitization which undermines commitment to a larger goal” (Buzan and Wæver 2009, 275). Implicit in this observation is the fact that it cannot be assumed that lower tiers will automatically follow middle-tier securitization processes—even in authoritarian systems. Ever since the 1980s, there has been a fragmentation of bureaucratic power in China between national and subnational actors. This fragmentation goes well beyond just the health sector to include economic policies, environmental regulations, and other areas of governance. Usually these are issues of domestic politics but the centrality of the Chinese biomedical and agribusiness sectors to international AMR efforts means that understanding Chinese policy and practice reactions to AMR is critical to evaluating the macrosecuritization of AMR globally.

During the 2016–2017 academic year, we conducted interviews in Beijing, Hangzhou, and Guangdong provinces to examine the current state of AMR policies and their application across China. This study was motivated by a move made on the part of the Chinese leadership to securitize the threat without an epidemiological trigger event that would rationalize such a decision (as occurred with, for example, the SARS outbreaks in Foshan and Hong Kong). In our initial interviews, we met with leading microbiologists, infectious disease specialists, and epidemiologists from the Chinese Academy of Sciences, the China Center for Disease Control and Prevention (China CDC), key research laboratories, and local universities. These interviews were supplemented with a second series of interviews with representatives from international health agencies (in China and globally), with public health specialists from other countries based in China, and with local researchers engaged in disease surveillance. Finally, we met with

Chinese farmers engaged in poultry and pork production. These interviews were conducted in Cantonese, English, or Mandarin under the Chatham House Rule. Although most of our secondary material is in English, we also engaged with Chinese-language publications.

After more deeply exploring the nature of macrosecuritization and its utility in analyzing AMR, we consider three dimensions of the Chinese response to AMR, namely: (1) how China has framed AMR as an existential health threat; (2) how antibiotics are used in Chinese society; and (3) how antibiotics are used in Chinese farming. Finally, we consider the implications of this analysis in two key areas: (1) the implications of AMR strategies on domestic politics and policy making; and (2) the role of the international community in securitizing AMR in China.

Macrosecritization and AMR

Macrosecritization emerged from securitization theory. Developed by the Copenhagen School of Barry Buzan, Ole Wæver, and Jaap de Wilde, securitization is a theoretical framework depicting the threat-framing process and the corresponding political reactions to eliminate a perceived threat. Most securitizations take place at the state and individual levels. The theorists believe that such a vibrant agenda at the middle level is attributed to the simplicity of identifying the referent objects in the securitization process. While the preceding middle-level security studies are of significance to enrich the research agenda of “niche” securitizations, what is still missing is the discussion of “what happens above [or below] the middle-level securitization (Buzan and Wæver 2009, 253).”

In filling the theoretical and empirical gap of securitization theory, Buzan and Wæver suggested the concept of macrosecritization. Macrosecritization refers to an “overarching securitization that relates, organizes and possibly subsumes a host of other middle-level securitizations” (Buzan and Wæver 2009, 256). Pertaining to the relationship between macrosecritization and its corresponding middle-level securitizations, Buzan and Wæver stated that the strongest form of macrosecritization, such as the Cold War, “will impose a hierarchy on the lower level ones incorporated within them.” The less powerful ones, such as the Global War on Terror (GWOt), will “bundle other securitizations together without outranking them” (Ibid). The relationship between macrosecritization and middle-level securitizations is, however, not necessarily peaceful. The structure is “vulnerable to breakdowns not just by desecritization of the macro-level threat (or referent object). . . but also by the middle-level securitizations becoming

disaffected with, or pulling away from, subordination to the higher level one” (Ibid). Owing to its large-scale, complex, and fairly unstable configuration, macrosecritizations have only been recognized in a handful of cases: the Cold War (Buzan and Wæver 2009), piracy (Bueger and Stockbruegger 2013), and the GWOt (Romaniuk and Webb 2015). Lo and Thomas (2018) added AMR as another case of macrosecritization, based on the extent to which AMR responses fulfill the basic format of macrosecritization and have been securitized at the global level. However, the relationships between the macro, middle, and lower tiers remain understudied.

Since the turn of the century, public health threats have been increasingly securitized, wherein threats have exceeded a state’s individual capacity to resolve them via regular political processes or via unilateral emergency measures. The securitization of HIV/AIDS in July 2000 by the United Nations Security Council was the first of these moves, which recognized that the global nature of the threat exceeded member states’ capacities to deal with it unilaterally (United Nations 2000). To resolve such threats has required additional capacity being contributed from either the international community or other states, or both. Yet, frequently (in the cases of SARS, MERS, or Zika), the resulting alliances of states, corporations, and/or civil society actors have been “temporary and instrumental” (Buzan and Wæver 2009, 256). Once the threat has ended or been sufficiently addressed, states return to using regular policies and practices. However, some threats are of a longer term or are sufficiently threatening as to require a larger-scale response. These types of threats—exemplified by new and re-emergent health threats—“are universalist because they take the physical fate of humankind as their referent object” (Ibid, 261).

In the case of AMR, a macrosecritization approach has utility, given the universalist nature of the threat and its global spread. As all countries are either already afflicted by AMR or threatened by its spread, a multilevel collaborative approach of the type described by Buzan and Wæver (2009) is necessary. However, this assumes that all countries regard the threat posed by AMR in a similar manner. In the United States, Commissioner of Food and Drugs, Scott Gottlieb (2018), stated that AMR was “a global public health threat.” In Europe, European Union (EU) Commissioner, Vytenis Andriukaitis (2017), declared that, “In 2001, antimicrobial resistance was a budding global public health threat. In the years since, it has grown into one of the biggest global threats not only to our health, but also to our environment, our food chain and our economies.” In the United Kingdom (UK), Chief Medical Officer,

Sara Davies (2013), stated that, “Antimicrobial resistance poses a catastrophic threat.” Each of these statements—and their accompanying text—are clear indications that AMR is perceived as an existential threat, one not limited just to the health sector.

As Gottlieb (2018) further noted, “The CDC estimates that the direct costs of antimicrobial resistance on the U.S. economy is \$20 billion annually. When you factor in the economic consequences of lost productivity, it adds an additional \$35 billion in costs.” At the global level, the World Bank estimates that, by 2050, AMR could cause annual global Gross Domestic Product [GDP] to fall between 1.1 and 3.8 percent, with increases in healthcare costs ranging from US\$330 billion to US\$1.1 trillion per year (World Bank 2017, 15–22). As a result, these countries have moved beyond speech acts to emergency mode reallocations of resources to address AMR. For example, in 2015 the United States allocated close to double the funding to different federal agencies to address the threat posed by AMR. Of the US\$1.2 billion allocated, over US\$1 billion was related to public health aspects of anti-AMR programs, with the remaining funds targeted to animal and agricultural AMR strategies (White House 2015). Between 2007 and 2013, the EU allocated €314.1 million (~US\$357 million) to AMR prevention programs (Kelly et al. 2016, 436), with member states making their own contributions. The UK, for example, has two funds for global AMR activities—the Fleming Fund and the Longitude Prize—which together contribute £295 million (~US\$382 million).

In contrast, in 2016, Indian Prime Minister Narendra Modi stated that “India recognizes anti-microbial resistance as one of the major global threats to public health” (O’Neill 2016). This speech act coincided with the development of India’s new National Action Plan on AMR, which was promulgated in April 2017. In that fiscal year (2016–2017), India allocated an additional 1.16 cr rupees (~US\$16,390,000) to address AMR. However, by 2017–2018, this figure had fallen to zero (Sinha 2018). This is despite the fact that India is one of the largest consumer markets for antibiotics. Indeed, in 2010 it was the largest market globally but, by 2017, it had fallen behind China (Van Boeckel et al. 2014, 745). Interviews we conducted in Thailand, Indonesia, the Philippines, and Vietnam in 2016–2017 all highlighted a similar disjuncture between rhetoric and intent. In each case, despite speech acts signaling an intention to address the threat posed by AMR, new resource allocations were negligible or short-lived—with the international community being a major source of funding on the issue. Moreover, the allocation of the new funds was a source of competition between different ministries, leading to resource mismanagement.

At the same time, a senior agricultural official for an international organization noted that, regionally, there was “no data sharing between different stakeholders, because they only see the downside of sharing data” (Interview J 2017).

The difference in these commitments has a critical theoretical implication for understanding the macrosecuritization of AMR, generally, and in the Chinese case, specifically. In particular, these differences highlight our argument that the intentions of lower-tier securitization processes must be clarified in order to properly assess the success (or otherwise) of a macrosecuritization act. As we argue in this article, for successful macrosecuritization to take place, all levels of the process must be aligned. As Balzacq (2005, 171) argues, “effective securitization is audience centered.” For Buzan and Wæver’s model, this means that if there are competing interests for lower-level audiences, then the macrosecuritization process would be imperfect, at best, and unsuccessful, at worst.

AMR in China

China is the world’s most serious abuser of antibiotics. (*Jiefang Daily* 2010).

Approximately 162,000 tons of antibiotics were consumed in China in 2013. Of these, human uses accounted for roughly 48 percent of consumption, with the rest being allocated to the agricultural sector (Tang et al. 2016). As such, not only do Chinese people lead the world in per capita antibiotic consumption, but also the country is the largest user of antibiotics in the livestock industry, which is only going to increase (Khazan 2015). This high use of antibiotics places China at the heart of global antimicrobial strategies. As with outbreaks of SARS and H5N1 in the first decade of this century, without a robust intervention strategy from China, the global effort to combat AMR will fall short of its eradication goal. This section advances our understanding of AMR as a health security threat in China. We first present a general overview of the rise of AMR as a policy issue before moving on to the issue with specific reference to humans first and animals second. Although these sectors are considered separately, this is a somewhat artificial divide. As will be shown in the following analysis, the basis for the threat posed by AMR is interchangeably located in both human practices and livestock production and is exacerbated by policy and regulatory shortcomings.

The Chinese government has only officially recognized the AMR problem in China over the past decade, although it has been monitoring the issue since 2004 (Interview A 2017). A 2013 figure showed that, on average, each Chinese person consumed 138 grams of

antibiotics annually, which is ten times more than the average volume consumed per capita in the United States (*China Daily* 2016). This pattern of antibiotic abuse is similarly observed in the livestock sector. Of the 210,000 tons of antibiotics made in China in 2006, a half was used to feed livestock for growth promotion and disease control (Collignon and Voss 2015). As the largest antimicrobial consumer for food animals, a 2015 study estimated that the Chinese livestock industry will represent one-third of antimicrobial production worldwide by 2030 (Van Boeckel 2015). While nationally comparative data is difficult to identify, a 2011–2015 study by Wushouer et al. (2017, 6–7) found that there was a “higher per capita consumption percentage in China during the study period than in at least 75 percent of the 29 European countries in terms of the consumption of third- and fourth-generation cephalosporins, as well as consumption of the fluoroquinolones.”

The overuse of antibiotics in humans and livestock for both therapeutic and prophylactic purposes has been directly linked to the rampant spread of AMR in China.¹ Surveillance data show that AMR resistance to *Neisseria gonorrhoeae* and resistance to penicillin, tetracycline, and ciprofloxacin are widespread in China (Chen et al. 2016). Xiao et al. (2011) found that approximately 70 percent of *Escherichia coli* (*E. coli*) samples are resistant to ciprofloxacin, while 60 percent are resistant to third-generation cephalosporins. Multidrug resistant and pan-resistant strains have been reported for *Pseudomonas aeruginosa* and *Salmonella Pullorum*, while pan-resistant strains have also been identified for *Acinetobacter baumannii* in human nosocomial settings. A 2005 study showed that antibiotic abuse kills 80,000 Chinese people annually and has increased medical expenditures by 80 billion yuan (US\$11.7 billion) per year (cited in Huang 2009). A 2016 report on the impact of AMR in China estimated that without prompt intervention, this problem could result in one million premature deaths annually by 2050 (Shan 2016). In other words, the potential existential threat to China from AMR has been well established.

However, given the long gestation of this threat, the question that naturally emerges is, why securitize it now? As China’s Permanent Representative to the United Nations, Liu Jie, stated, “We are in a race against time. We need to make every moment count and intensify our

actions. We cannot afford to lose this competition” (Li 2017). Interviews with international health representatives and public health officials and clinicians in China suggest that two key factors have come together to increase policy awareness of this threat. The first factor concerns the lack of new antibiotics being released. Only small profit margins are available to pharmaceutical companies for the development and sale of new antibiotics, for which resistance would not be an issue. As a result, growing resistance to existing antibiotics is not being mitigated by new antibiotics coming to market. As Khor (2016) observed, “AMR is not confined to just a health issue—the entire situation is increasingly recognized as a market failure. Due to perceived poor returns on investment, the development of new antibiotics has almost come to a halt.” Indeed, in 2018, Novartis joined AstraZeneca, Sanofi, Bristol-Myers Squibb, and Allergan in exiting the antibiotic development field, further limiting the pool of possible sources of new antibiotics (Megget 2018). This challenges an earlier mentality on antibiotics that one interviewee succinctly described as follows: “In the past, scientists and policy makers believed that as long as new antibiotics rolled out there was nothing to worry about” (Interview A 2017). The rapidly narrowing gap between what is available and what is viable has contributed to a heightened sense of threat from AMR. However, at the same time, the departure of five major pharmaceutical companies from antibiotic research and development also challenges the assumption that a successful macrosecuritization of AMR has taken place. If it had, it could have been expected that development of new antibiotics would have been stepped up and/or more new companies would have entered the market.

The second factor concerns the fact that, in a post-SARS environment, there is pressure on the Chinese state (and by extension the Party) to ensure a safe public health environment. Every subsequent outbreak (H5N1, H1N1, H7N9, and MERS-CoV), coupled with episodic food safety issues, have raised social questions surrounding efficient and competent governance by local and national authorities. In terms of AMR, “in the wake of the SARS outbreak, the Chinese government was aware of the AMR problem, thereby establishing the Ministry of Health National Antimicrobial Resistance Surveillance Net (MOHNARIN) in 2005. Currently over 1,300 hospitals are included in the sentinel surveillance system” (Interview A 2017). However, MOHNARIN is a passive surveillance system with no incentives that punish hospitals when they fail to report their findings. Indeed, several interviewees noted that hospitals can willfully withhold samples to argue for more equipment and upgraded capacities (human and technical). While such

1 From information available, this suggests that high volumes of sulphonamides, tetracyclines, and fluoroquinolones (enrofloxacin, fleroxacin, and norfloxacin) are widely used in the agriculture sector in China (Collignon and Voss 2015).

behavior only exacerbates risks posed by AMR, it also demonstrates that AMR is not considered an existential threat by these frontline healthcare providers. Theoretically, samples should be shared as a means to ensure survival. Instead, samples are used as bargaining chips to secure more resources. This behavior also reflects “the emperor is far away” reality of Chinese policy making. Even when a national program is in place, subnational actors can still subvert the ends of the program for their own means.

In 2015, the centrality of Chinese health governance to the global AMR debate was highlighted by the identification of a mobilized colistin resistance (or MCR-1) gene in a pig. This discovery was important, as the gene provides bacteria with resistance to colistin, a last-line antibiotic (Gao et al. 2016). As with SARS, it is likely that the gene was in circulation in China before the initial study reported its existence. MCR-1’s emergence is likely due to Chinese farmers, who regularly feed livestock colistin prophylactically.² A 2016 study revealed that 21 percent of pigs in China carried bacteria with MCR-1, as did 15 percent of tested chicken and pork meat samples as well as 1 percent of all hospitalized Chinese patients (Liu et al. 2016). As of March 2017, the gene had been detected in humans, animals, and livestock products in North America, Europe, and Asia (Centers for Disease Control and Prevention 2017). Hence, even though the initial creation of the gene is likely a result of inappropriately utilized antibiotics for livestock production, it has developed multiple avenues for transmission beyond its original environment.

The identification of MCR-1 not only raised further questions regarding health governance but also raised questions regarding the relationship between business interests and officials, and the capacities of the central leadership to implement reforms in the face of local opposition. As one interviewee observed, “In the US it is about the lobby groups; in China, politicians and medical institutions are the ones influencing the policy making. In China, there are over 6,000 pharmaceutical companies. Some pharmaceutical companies are one province’s economic pillars” (Interview A 2017). This statement further confirms an important facet of Chinese health policy; namely, that despite its status as a one-party state, the decentralized nature of the contemporary state means that local officials can resist or subvert central policies when they are not in their economic or political interest.

In August 2016, President Xi Jinping unveiled a *National Action Plan (NAP) to Contain Antimicrobial Resistance (2016–2020)* in an attempt to push through a centralized AMR strategy. The NAP was quite specific in identifying areas whose shortcomings fostered AMR, stating that it:

has become increasingly prominent due to insufficient research and development capacity of new antimicrobials, sales of antimicrobials without prescriptions in pharmacies, irrational use of antibacterial agents in medical and food animal sectors, non-compliant waste emissions of pharmaceutical enterprises, as well as lack of public awareness toward rational use of antimicrobials. (National Health and Family Planning Commission 2016a)

Here the NAP drew on lessons learned from earlier infectious disease outbreaks (e.g., HIV/AIDS) to involve a wide array of 14 central-level ministries and commissions. However, it is telling that despite most of the “known unknown” threats of antibiotic misuse stemming from inappropriate usage in agricultural activities, the lead bodies of the NAP are the National Health and Family Planning Commission (NHFPC) and the National Development and Reform Commission (NDRC). While earlier cooperative efforts between the NHFPC and the Ministry of Agriculture are acknowledged in the NAP (National Health and Family Planning Commission 2016b), this means that the primary focus for intervention is on human misuse (i.e., an area that can be managed without jeopardizing China’s performance in a key area of the economy).

This policy focus on the misuse of antibiotics by people does correspond with a general sentiment observed among our interviewees. Despite this, antibiotics, by volume, are more widely used in agricultural activities, with nearly half “deployed in food animals” alone (Collignon and Voss 2015, 2). Further, in regard to understanding the volume of antibiotics provided prophylactically through feed, China faces the same problem as other countries in that such data are considered commercially sensitive and are not provided by companies.³ However, given that eight of the top twenty global producers of animal feed are Chinese companies (WattAgNet.com 2017), all of which have state ties, this should not be as much of a barrier for the Chinese government as for its counterparts around the world. Indeed, given that Chinese authorities

2 It should be noted that colistin is not used in Chinese clinics. It is only used in China for livestock production (BBC Zhongwen 2017).

3 A study by Enting et al. (2010) does explore the composition of animal feed produced in China, but the authors did not consider antibiotic inclusion, focusing instead on vitamins.

have (occasionally) paid scant regard to commercial sensitivities in areas of industrial intellectual property, their reticence to do so in this area only highlights the economic sensitivity of agriculture. In terms of framing AMR in China, this economic prioritization challenges the existential nature of the threat, limiting its immediacy and giving preference to rhetorical and discursive securitization over a full shift into emergency mode. To better explore why this is the case, the threat posed by AMR to the human and animal populations will now be considered.

Human Use of Antibiotics in China

The time may come when penicillin can be bought by anyone in the shops. Then there is the danger that the ignorant man may easily underdose himself and by exposing his microbes to non-lethal quantities of the drug make them resistant... Moral: If you use penicillin, use enough. (Fleming 1945)

Alexander Fleming's 1945 Nobel Prize address included a prescient warning on the dangers of misusing antibiotics, but this represents only half of the equation. Fleming's comments were made at a time when antibiotic supplies were still limited for most people and a year before biochemists identified the use of antibiotics as growth promoters in livestock. While the development of resistance can originate from insufficient quantities of antibiotics, a host can be equally endangered from using too many antibiotics. In China, the latter issue is more severe within the population. A nationwide survey of 230,800 prescriptions, given across 784 community health institutions in twenty-eight Chinese cities from 2007 to 2009, shows that the number of antibiotic prescriptions given was two times more than that recommended by the WHO (Li et al. 2012). Another report showed that roughly 57 percent of people in China had received antibiotics over the previous six months in 2015 (Zhongguo pinglun tongxunshe 2015). This was an issue that Fleming could not have foreseen (i.e., that the level of resistance in a population can be a medical threat as much as an individual's resistance).

It is also a cultural trend in China that people take too much medicine to treat illnesses that do not require antibiotics while simultaneously failing to follow correct treatment protocols. To make this situation worse, patients with either minor ailments or non-serious illnesses frequently seek to have antibiotics intravenously administered from healthcare providers at all levels (tertiary, secondary, and primary). This is due to the widely held belief that an intravenous (IV) drip (*dadiandi*) is a panacea for all kinds of illnesses. A 2009 study indicated

that the average person in China consumes eight bottles of IV infusion fluid per year against a world average of 2.5–3.3 bottles per person (World Health Organization 2012). This figure highlights not only the role that IV antibiotic injections play in the rampant misuse and overuse of antibiotics in the country but also the complicity of healthcare professionals and institutions in the inappropriate provision of medicine.

Apart from this behavior, inadequate government investments in healthcare have resulted in a reliance on drug sales to generate revenues to cover operational expenses. A 2014 study demonstrated that antibiotic sales accounted for 22.8 percent of revenues from all drug sales made through primary healthcare facilities (Wang, Wang, and Wang 2014). While the profitability of antibiotic sales in healthcare settings varies in different regions of China, these figures underscore financial incentives for medical staff to sell high volumes of unnecessary and expensive antibiotics to patients. In exploring issues related to the human use of antibiotics, the following section analyzes the efficacy of regulatory approaches imposed by the Chinese state. We suggest that while cultural habits are the most difficult for any state to change, the efficacy of the regulatory environment of the health sector is the one single issue that must be addressed if AMR threats are to be resolved.

Policy Responses to the Human Use of Antibiotics in China

Since the turn of the century, the Chinese government has adopted various strategies to limit reliance on pharmaceuticals, including antibiotics. The China Food and Drug Administration (CFDA) and the NHFPC are the two main government agencies tasked with regulating antibiotics in China. The former agency is responsible for registering, producing, and distributing medicines, while the latter oversees the clinical use of antibiotics in pharmacies and health facilities (Cui et al. 2017). Prior to 2004, there was no specific law or regulation on antibiotics use in China; general medicines (including antibiotics) were regulated under the *Drug Administration Law of the People's Republic of China*. This law was adopted at the 7th Meeting of the Standing Committee of the Sixth National Peoples' Congress on September 20, 1984, and was revised at the 20th Meeting of the Standing Committee of the Ninth National Peoples' Congress on February 28, 2001 (China Food and Drug Administration 2001). (NHFPC 2004) to regulate the clinical use of antibiotics. (MoH 2012), which further reinforced the 2004 guidelines to curb the human abuse of antibiotics. However, despite China's reputation as a centrally

run state, the guidelines were only imperfectly followed at all levels of the domestic healthcare system, as the financial opportunities to be made from overselling antibiotics were too great, and demand from the population remained strong.

In response, the government introduced the Essential Drug List (EDL) in 2009 to curb the misuse of antibiotics by its citizens by capping the financial benefits that healthcare providers could accrue from the sale of antibiotics. However, while some studies show a slight reduction in the prescription of antibiotics (Song et al. 2014), the use of such medicines remains high. Currie, Lin, and Meng (2014) observed that despite the EDL being implemented, social behaviors in China with respect to the use and supply of antibiotics have not changed, with patients still wanting antibiotics and with doctors still willing to prescribe them beyond what patients' conditions warrant. In addition, there is an entrenched habit among patients to seek antibiotics by engaging in polypharmaceutical behaviors either by visiting numerous doctors for the same condition or by purchasing multiple courses of drugs from pharmacies.⁴ As multiple studies have noted, prescriptions for antibiotics account for roughly half of all prescriptions made by doctors (Yin et al. 2013; Lin et al. 2016).

One main reason for the overprescription of antibiotics lies in a lack of health budgets. Public hospitals receive only 10 percent of their funding from the government, and so they make up the 90 percent shortfall by charging patients for medicine (Lazarus 2016). More importantly, public hospitals are allowed to sell medicines and antibiotics with a 15 percent markup to cover operation expenses. Regulatory attempts made by the state in 2009 to cancel this markup practice as part of the EDL reform did not, however, effectively resolve the problem, as problems related to financial incentives were not fully addressed. The latest effort to address this issue is the 2017 *Trial Opinion on the Implementation of a Two-Invoice System for Public Medical Institutions' Drug Procure-*

ment, or the "two-invoice system" for public medical institutions. Under the new system, manufacturers send their products to a distributor, and these products are then transported directly to hospitals or clinics (Li and Sindik 2017). This is an important reform developed to standardize drug circulation, to reduce the number of drugs in circulation, and thus to lower drug prices (as prices increase with the number of distributors and intermediaries involved/with the number of invoices issued). However, a senior AMR scientist commented that, "without an increase in budgets to public hospitals, medical institutions have to find ways to gain profits to sustain daily operations. Whenever there is a need for healthcare facilities to determine their own budgets (intermediate environment), the problem of AMR cannot be mitigated in China" (Interview A 2017).

This resources shortfall again highlights the problematic nature of AMR securitization in China. If the Chinese authorities had actually securitized AMR, there should have been a corresponding shift of resources into key sectors and institutions (such as hospitals). While funding to the public healthcare sector has increased in percentage terms (State Council 2017), it is coming off a low base, one where most of the new fiscal capacity is to support long-term institution building rather than directly addressing an existential threat from AMR or similar health insecurities (Süssmuth-Dyklerhoff and Wang 2010). As McInnes and Rushton (2013, 128) argue, "although the absence of emergency measures may not in itself be conclusive, it may offer an indication that an issue has not been fully securitized." In the absence of a resources shift by Chinese authorities, it is hard to argue that the motivation for securitizing AMR is to deal with the perception of it as an existential threat.

The absence of centralized patient drug registries between doctors and between pharmacies and local healthcare providers has created another gap through which antibiotic abuse can continue. While some administrative regions, such as Shanghai, have developed strategies to regulate antibiotic distribution through the public health system at tertiary hospitals, this has limited efficacy when aggregated at the national level. In response to the 2009 National Essential Medicines Policy (NEMP), the Shanghai government instituted new policies whereby "presidents of hospitals were required to take full responsibilities [*sic*] for the use of antibiotics and were subjected to annual assessments of performance, resulting in potential dismissals or promotions" (Y. Lin et al. 2016, 1,724). While such policies are credited with reducing antibiotic usage in public hospitals, most healthcare services in China are delivered by primary providers, meaning that the effects of such practices are limited to the

4 An instance one researcher directly observed involved a single individual using a collection of identity cards to purchase multiple courses of antibiotics. The medicines were prescribed for a single individual, whose friends and family members loaned him their cards. The pharmacy's records simply noted a series of individuals who had come in on the same day to purchase the same medicine. The intent of the individual purchasing these drugs remained completely open and, by using a set of identity cards, the pharmacist involved was able to make a profit while still having a record showing that they were operating within the rules.

national level (Zhang et al. 2017). Moreover, there are spatial inequalities in the distribution of resources for hospitals across China, with institutions in the eastern developed states receiving more resources than those in the poorer central and western regions.

However, economic status does not automatically guarantee a better understanding of the role of antibiotics in treating infections. As Barber et al. (2013, 2) stated, “Economic and demographic factors have resulted in increased demand for essential medicines.” This is particularly the case in urban areas where “residents tend to have higher disposable income, and access to a greater supply of medical products and services.” Although Barber et al.’s study focuses on non-communicable diseases (NCDs), their conclusions on the misuse of antibiotics are supported by Bu et al. (2016, 1,388), who determined that “the spatial distribution of antibiotics uses is determined by the economic status in China where wealth and resource are unevenly distributed and that are undergoing dramatic change.” In the case of wealthier areas (which are always urban areas in China), the authors note that the per capita actual-use volume of antibiotics is higher in these areas and that this could be attributed to the abuse of antibiotics.

Lowy (2003, 1,266) concluded that the emergence of AMR first “in hospitals and then spreading to the community, is now a well-established pattern that recurs with each new wave of antimicrobial resistance.” However, in the case of China, it is not clear whether this pattern holds true. While hospitals remain important sites for addressing AMR, the disaggregated nature of the Chinese public health system means that frontlines for the development of AMR are far more community-based than they are in more developed countries. The most obvious area where this can be seen is in the distribution of antibiotics and other medicines. Here, the distribution of and access to antibiotics—frequently in unregulated or under-regulated environments—mean that Chinese waves of resistance are disaggregated across the country, fueled by mutually reinforcing public and animal sources. This presents a significant challenge to domestic and global efforts to combat the threat posed by AMR.

This is also a clear outcome of a profound lack of public education on drugs and medicines within local communities and in the school system. A senior Chinese AMR scientist stated, “People have low awareness of AMR issues because few media outlets report on the problem. For example, there are many anti-tobacco advertisements, but there are none on AMR. There is also no education campaign on antibiotic use in primary and secondary schools” (Interview A 2017). One university

academic in Beijing likewise stated, “Education on the proper use of antibiotics is nonexistent in schools. There is no booklet/poster on the proper use of antibiotics in rural health facilities” (Interview B 2016). These opinions are further supported by a senior officer of an international financial institution, who concluded that, “Health promotion in China is merely about information giving. Insufficient information or knowledge does not change people’s behaviors. People still kill and eat sick chickens; others believe that if one falls sick after eating a sick chicken, this is just a result of bad luck” (Interview C 2017). Within the Chinese system, a lack of such education campaigns reinforces our point that without public awareness of the issue, there cannot be audience acceptance of the securitizing act, particularly at the lower tiers, restricting attempts to securitize the threat beyond the middle tier.⁵

Indeed, it would be a mistake to assume that simply because Beijing has developed new policies and regulations on the use of antibiotics, such policies should be automatically implemented nationally (even with the securitizing move). As Hu (2013) observed, there are differences in ways that the policies are implemented between provinces and between the public and private healthcare sectors. This is supported by Qian (2015, 31–2), who concluded that “local bureaus are likely to be accountable for the local government leaders rather than their ministries when implementing the health reform (e.g., local health bureau vs the NHFPC), which makes the coordination among government departments at the central level even more complicated.” In terms of macrosecuritization, this suggests that even in authoritarian states, substate actors have the capacity to prioritize competing strategies over national-level securitization acts. This reinforces Buzan and Wæver’s (2009, 275) point that it is necessary to consider the lower tiers when evaluating a successful macrosecuritization.

Use of Antibiotics in the Food Chain

The post-1970s agricultural sector in China has been shaped by three mutually reinforcing drivers. The first has been the country’s economic liberalization. Initially promoted by Deng Xiaoping, China has since become a global economic player that is deeply enmeshed in the international trade system. This has led to rising incomes and to a shift in patterns of food consumption away from a grain-based diet to one wherein meat plays a more dominant role. In terms of international trade, this long-term

5 A similar restriction occurs with the securitization of HIV/AIDS in China (Lo 2015).

period of economic development has also led to more intensified livestock product trade, coupled with an awareness of the importance of quality control. The latter factor in particular is supporting a growth in imports from overseas markets that are perceived to be safe and/or a source of higher-quality meats (e.g., Australia, Canada, and New Zealand). However, even though food safety is an ongoing issue for Chinese consumers, it is focused on more explicit problems—melamine in dairy products, for example—and less on the presence of antibiotics in local food production processes.

While the “open door” strategy was primarily focused on the industrial sector, parallel reforms made in the agricultural sector have caused China’s production of livestock to rise significantly. This is the second of the three drivers. In reference to the cattle sector, [Qiu, Ju, and Chang \(undated\)](#) estimated that there were only 100,000 head of cattle in 1949. By 2013, this had increased to over 113 million head of cattle ([Han et al. 2016](#)). As Sampaio stated in [Reed and Rodrigo \(2015\)](#), “Beef consumption is directly related to income. China has rising incomes and a large population. This is reflected in an increase in protein consumption.” Similarly, Chinese pork production levels have increased sevenfold since the late 1970s, rendering China the largest consumer and producer of swine products in the world ([The Economist 2014](#)). In line with these trends, Chinese production of poultry and eggs has also increased markedly since the liberalization of the agricultural sector. China is now the second largest producer of chicken meat and the largest producer of eggs in the world, with both chicken meat and eggs forming a significant part of the daily Chinese diet. This growth in both livestock production and antibiotic usage has been and will continue to be facilitated by an ongoing structural reorganization of Chinese farms away from small-scale operations to large commercial operations. While this mirrors changes occurring in other countries such as the United States, it has not been accompanied by a concomitant increase in food safety.

An awareness of the shortcomings of the current meat production system has become more public from the turn of the century, and this has been tied in the public consciousness to questions of quality control in the production and distribution of foodstuffs. A 2008 study showed that 10 percent of rice sampled from the Yangtze Delta was contaminated with cadmium ([Zhen 2008](#)), a figure that rose to 37 percent in a study conducted in the following decade ([Liu et al. 2016](#)). In 2008 and 2009, major food safety threats emerged from the adulteration of Chinese milk and dairy products with melamine and the infusion of insecticides into dumplings exported to Japan ([Japan Times 2008](#)). All of these issues have been debated

in the Chinese social and public media. However, the threat potential of AMR—from the overuse and abuse of antibiotics in the agricultural sector—has been frequently overlooked.

To combat the rise of disease in the commercial farming sector, Chinese agribusinesses have relied on a triple cocktail of antibiotics. In addition to prophylactic and therapeutic doses of antibiotics, feedstock is also laced with antibiotics. While maximizing the growth potential of livestock is an intended outcome of this cocktail, as commercial farming has intensified in China, this triple dose of antibiotics has become necessary to combat the increasingly unhygienic conditions in which many of these animals are raised. Here, the difference between Chinese commercial farms and those in, for example, the United States is stark. Cargill, for example, has begun to phase out antibiotics use in its swineherds ([Cargill undated](#)). This has been achieved with only slight increases in disease prevalence and slight losses of growth potential (Interview D 2017). Hence, the rationale to use antibiotics as a growth promoter that emerged after the Second World War, and which continues to dominate production plans in Chinese commercial farms, is no longer necessarily valid when a hygienic environment is established.⁶

Currently, there are no official data or information on levels of antibiotics used in Chinese agriculture ([Krishnasamy, Otte, and Silbergeld 2015](#)). In terms of the volume of antibiotics used for animal husbandry in China, Xiao estimated that 46 percent of the 210,000 tons of antibiotics produced in China are administered through the livestock industry ([Hvistendahl 2012](#)). Another 2012 estimate suggested that in China, 84.9 million pounds (38.5 million kg) of antibiotics were used on livestock ([Garrett and Laxminarayan 2017](#)). [Krishnasamy, Otte, and Silbergeld \(2015\)](#) suggested that sulphonamides, tetracyclines, and fluoroquinolones (enrofloxacin, fleroxacin, and norfloxacin) are widely used for animal husbandry in China. Of the two main groups of meat products (pork and poultry) produced in China, the authors calculated that 4.5 million kg of antimicrobials were used for poultry production, while 34 million kg were used for swine production in China in 2012.

While the use of antibiotics for growth promotion, disease prevention, and therapeutic purposes is a longstanding practice of the food animal industry worldwide, [Van Boeckel et al.](#) argue that the main goals of antibiotic administration are growth promotion and disease prevention rather than disease treatment. China is no

6 A potential model for such an approach for China is shown in [Bloomberg \(2016\)](#).

exception. In China, while the human abuse of antibiotics is partly attributed to financial incentives for public healthcare facilities to sell unnecessary and expensive antibiotics, the overuse of antibiotics in the animal husbandry sector is likewise induced by economic incentives for the use of antibiotics as growth promoters. Despite the fact that data show little or even no economic benefits in terms of meat production, growth promotion uses are a major contributor to antibiotics usage in Chinese food animal farms. As the largest antimicrobial consumer of livestock in 2010, China used one-third of all growth-stimulus antibiotics fed to livestock worldwide (Van Boeckel et al. 2015).

The economic incentive that encourages antibiotics use in livestock production was highlighted in an interview with a chicken farmer in Guangdong province in June 2017. Our interviewee stated that, “Chickens fed with artificial feed premixed with antibiotics grow much faster than those fed with homemade feed. It takes only 40 days for the former chickens to be ready to sell on the market and 200 days for the latter” (Interview E 2017). The same farmer noted that when he and other farmers can access cheap human antibiotics, these are also fed to the animals for either growth promotion or therapeutic purposes. This echoes comments made by the head of a Chinese microbiology lab who mentioned that “the effectiveness of tetracycline [as a growth promoter] remains inconsistent. In any case, farmers feel that tetracycline and antibiotics in general facilitate livestock production, and so they add antibiotics to livestock feed” (Interview F 2016).

This belief in the use antibiotics as effective growth promoters is likewise seen in China’s swine industry, especially the use of colistin (polymyxins E) in pig farms (Zhongguo pinglun tongxunshe 2015). One reason for colistin’s widespread application in piggeries is its toxicity, which meant Chinese authorities never approved it for human use. Another reason is that colistin is an older drug and so it is fairly cheap; therefore, Chinese farmers can administer a large volume of colistin together with animal feed at a low cost. Recent figures show that, as the world’s largest pig producer, China is also the largest consumer of the 12,000 tons of colistin in agriculture each year (Zhang 2015). China is also one of the world’s largest producers of colistin for animal husbandry. Although the dangers posed by using such last-line antibiotics in livestock are well documented, only recently have these dangers been tied to the use of colistin in the Chinese swine industry. In 2015, MCR-1 was found in pigs in China. A year later, the gene was identified in humans, some of whom had acquired their infections from animals directly or from eat-

ing pork (Garrett and Laxminarayan 2017). MCR-1 is now found on every continent. The global spread of the gene implies that humans are losing a last-resort antibiotic for curing deadly drug-resistant superbug infections (e.g., carbapenem-resistant infections). The emergence of colistin resistance has sparked fears concerning public health in China, renewing calls for urgent policy responses to address the use of antibiotics for animal husbandry.

While China has instituted programs to regulate the clinical use of antimicrobials, limited efforts have been made to reduce drug use in animal feed (Krishnasamy, Orte, and Silbergeld 2015). Prior to 2016, China did not impose any restrictions on antimicrobial growth promoters (AGPs) and did not require veterinary prescriptions for antibiotics use. In response to the 2015 discovery of colistin-resistant bacteria on farms, China banned the use of colistin as a growth stimulant for animals as stated in the 2016 NAP (Hancock and Xia 2017). Reports, however, indicated that colistin remained freely available for sale on Chinese markets (Lazarus 2016).

This again highlights the problem of financial counterincentives and weak levels of regulatory enforcement, where “law enforcement is always a problem in this country [China]” (Interview F 2016). According to one interviewee, “farmers will not change their behaviors unless the punishment is more significant than the benefits they can gain” (Interview G 2016). It also reinforces our argument that the securitization of AMR in China is not being undertaken to address an existential threat. If it were, an effective colistin and AGP ban would have been promulgated. Indeed, as we have discussed throughout this article, the logic of the Chinese securitization act is to enable the policy center to gain greater enforcement capacity over its subnational counterparts. This conclusion extends our earlier point that it is necessary to consider the behavior of lower-level actors in applying macrosecuritization approaches to encompass the necessity of taking the relationships between actors at different levels into account, in this case, between the individual and the state. The fact that even in authoritarian states—such as China—the individual still has agency to resist or subvert securitization acts further suggests that Vuori’s criticisms of securitization being inherently Eurocentric need to be reconsidered (Vuori 2008).

Apart from the weak enforcement of policies, the focus of current AMR-related regulations and guidelines in China is mainly on human misuse rather than on animal antibiotics use (as highlighted by Wang et al. 2016). Wang et al. (2016) also show that the Ministry of Agriculture has not been involved in any of these AMR measures as a major player. Without the greater involvement of the

animal sector, the AMR problem in China can only ever be half-solved. Given the obvious nutritional links between animals and humans, ignoring the animal health sector at the expense of public health priorities highlights the implications of competition between different policy communities wherein intended outcomes—addressing threats posed by AMR—are the result of resource allocation debates between middle-tier state agencies and their subnational counterparts.

Emerging Implications

Policy-Politics Implications

This policy competition also highlights the nonexistential nature of the AMR challenge in China. If AMR was considered an existential threat to human wellbeing in China, then the purpose of the securitization would be to seek an end to the threat so that a normal mode of policy making and politics could resume. Such an act would enable policy makers to address the prevalence of the threat, equipped with emergency resources drawn from as many sources as necessary. The imbalance in the Chinese approach to AMR, coupled with a lack of resources available to monitor the situation, suggest that at the central level, AMR is being discursively securitized with only the partial enactment of an emergency mode approach. Moreover, the willingness of subnational authorities and healthcare providers to not fully implement regulations that would limit the impacts of antibiotics further suggests that the target audience has not accepted the securitizing speech act.

The ability of subnational authorities to set aside or resist central directives is not limited to the Chinese health sector. This is particularly observable with policy initiatives that carry an economic cost to local actors. In terms of macroeconomic policies, Wang (2015, 336) concluded that when such policies run “contrary to provincial economic rationality; consequently, provincial governments tended to resist these policies.” Conversely, when it comes to local resistance to tax reforms, Beijing does not allow for deviations to reforms. That said, local authorities must still implement additional revenue-raising programs. As Bergsten et al. (2008, 77) noted, “in the face of revenue pressures, many local officials have little recourse but to ignore central directives on such issues as growth planning and resource management.”

Here the presence of potentially significant economic costs arising from a rapid introduction of new policies designed to combat AMR—and the associated political and social fallout—has created a political and policy disincentive to make the shift into emergency mode. These

political and economic costs only serve to render meaningful efforts made within states and at the global level more problematic. As a senior official from a U.S. aid-related agency further observed, “Nowadays, the world is trying to reboot the AMR issue. However, the coordination does not exist with the absence of an emergency or clear threat (i.e., a zoonotic disease outbreak that killed both animals and humans)” (Interview H 2017). The absence of such coordination further argues against a perception that AMR is an existential threat, even though its potential is internationally acknowledged.

These cases of subnational pushback further suggest that provincial and other lower-tier authorities have a higher degree of policy autonomy than should otherwise be the case under a centrally planned and managed system. Heilmann (2008, 29) argues that “conceptual dichotomies such as centralization vs. decentralization, or constitutional concepts that suggest a stability of vertical checks and balances, such as federalism, cannot capture the oscillating dynamics of China’s policy-making approach.” This form of “adaptive authoritarianism” denotes “an entrenched process of policy generation” wherein both central and subnational authorities are constantly negotiating and renegotiating policy outcomes. This iterative process captures the ambiguity that Buzan and Wæver (2009, 256, emphasis added) identified, namely that macrosecuritization only “possibly subsumes a host of other middle-level securitizations.” In other words, even though subnational authorities cannot be said to be independent actors, they nonetheless have the capacity to pursue policies that are distinct from those of the center, even when such policies are unsupportive of an act of securitization.

What this means is that in the absence of an existential health threat—securitizing rhetoric and behavior aside—Chinese AMR policies represent another facet of the recentralization/decentralization struggle between policy communities where central powers and authority clash with local politics and economic-resource allocations. Given that it is primarily the economic capacities of such subnational actors that imbue them with the ability to resist or distort central-level objectives, access to external funding has become a key factor in getting central policies accepted in the face of local uncertainties and resistance. However, should an actual existential health threat from AMR emerge, central authorities in Beijing would likely enforce changes to current practices. From the examples presented in the main body of this article, it can be concluded that the threat posed by AMR has not yet reached that perceptual threshold for action despite rhetorical efforts to the contrary.

The Role of the International Community

Both securitization and macrosecuritization theories utilize levels of analysis, although the more recent macrosecuritization better elucidates the impact that global-level acts can have on states and lower tiers. What is clear is that the decision to focus on AMR in China has been a direct result of an opening provided by policy shifts in global health security agendas. These shifts have been particularly championed by the United States and the UK. This has led to increased attention being paid to the issue by other major states. Both the Centers for Disease Control and Prevention and the U.S. Agency for International Development bring significant financial and human resources to bear in developing states, which otherwise do not have the capacity to securitize AMR. In China, while most of public policy resources are focused at the national level in Beijing, both organizations work directly with local officials in the provinces either on projects or in terms of training field epidemiologists. Similarly, the UK and European states have run capacity-building workshops on AMR in China. In parallel, the WHO and the Food and Agriculture Organization of the United Nations (FAO) have been working with their state counterparts in developing AMR-related policies, although, as noted above, the vertical nature of these global-state-level relations have also hindered the effective implementation of AMR responses.

However, an unexplored aspect of macrosecuritization is the ways by which middle-tier actors can engage with the macro-level processes in order to realize different goals. By expanding the focus of AMR efforts to the global level, states are able to internally exert policy pressures that create a discursive policy space, which, in turn, allows resistant domestic policy communities to be bypassed. China is not a unique case in this instance. Since AMR has been macrosecuritized, for example, all the leading states (the United States, the UK, and the EU states) have implemented new national policies to address the threat despite opposition from internal lobby groups. This is despite the fact that the threat posed by AMR has been long recognized. As such, the recent efforts made by the international community to macrosecuritize AMR need to be unpacked, so as to illuminate whether these acts represent global action on a global threat or are designed to meet domestic agendas. While acts that encompass both possibilities cannot be ruled out, the motivations behind the macrosecuritization need to be clarified in order to fully evaluate it.

The impact that external agencies can have on domestic policy agendas comes down to the funding differential and local political will. In this respect, there is a clear distortive effect of such agencies in China, where lo-

cal officials, healthcare providers, and health researchers adopt new research projects to secure funding. However, as our interviewees confirmed, those who are unsuccessful in bidding for international monies quickly return to their original research interests. Equally, those who are successful are unlikely to continue with this research once grant monies expire unless the topic was being studied previously. This does not mean that such monies cannot have a catalyzing impact on policy and research communities, but it does mean that, without a pre-existing foundation for such activities, such impacts are likely to be limited. As one interviewee suggested, “money” has been the sole source of Chinese interest in AMR (Interview I 2016). Money in this context refers to financial support from non-Chinese sources. This financial support advances the AMR macrosecuritization agenda but is not sufficient to support ongoing, country-wide programs.

Money is also perversely central to why the issue has not progressed as far as the rhetorical acts would otherwise suggest. As we argue, other epistemic communities at the central and subnational levels have either competing agendas or conflicting interests; all of which are seeking financial, technological, and/or human resources to advance their interests. When new financial resources are allocated, these competing agenda groups seek to co-opt them for their own programs. In the absence of a truly existential threat that overrides this competition, such behavior suggests that audience acceptance is more about the outcome of power relations among stakeholders (Balzacq 2015, 106). In this case, support for China’s AMR policy has become a proxy for situating decision-making authority and delegating resources between state and subnational actors.

Nonetheless, due to the size of China’s population and owing to its role as one of the world’s largest suppliers of produce (particularly meat), this issue cannot only remain a source of domestic policy contention. The spread of the MCR-1 gene demonstrated how a significant threat to the world’s capacity to fight antibiotic resistance emerged from China’s misuse of antibiotics. The impact of this domestic problem had global effects in less than a year. Hence, an international interest in Chinese policy making in this area will remain. However, such external interest is frequently a source of geopolitical tension between China and other states and international organizations.

Our interviewees noted that China has been refocusing its international cooperation efforts on technical areas and away from policy cooperation and alignment programs. This is partly a necessary endeavor to address capacity shortfalls and is partly an effect of the

current political climate in China. In this respect, the focus on AMR works for the Chinese leadership, as current programs are largely concerned with surveillance and microbiological impacts rather than with policy initiatives. As such, global health policy efforts on AMR are screened when applied to China: data collection and technological aspects are permitted, while social and public health policy aspects are restricted or excluded. From our interviews with representatives of international health organizations, external health agencies, and domestic actors, this shortcoming is well known, globally and within China. However, the desire to address the threat of AMR and to develop global action on the issue is governed by realpolitik considerations that accept suboptimal commitments in exchange for consensus building. Nonetheless, without a holistic approach that encompasses all aspects, AMR cannot be comprehensively addressed. The unwillingness of the Chinese government to develop a broad-based approach to AMR reinforces our central argument that the current efforts to securitize the issue are concerned with issues other than its existential threat potential.

Conclusion

The above analysis inspires a number of conclusions, including one on the need for greater complexity in macrosecuritization theory. As this study demonstrates, there is a clear need to go behind the speech act in order to understand it.⁷ Hence, while Buzan, Wæver, and de Wilde's (1998) original assertion that anyone can securitize anything remains valid, the assumption that the process—when developed through its subsequent stages—is intended to address an existential threat can be challenged. Only by focusing on a pre-stage level at which motivations for the securitizing act can be examined can the rationale for securitization be properly determined. Furthermore, when this rationale is absent or subordinated to another purpose, the macrosecuritization or lower-tier securitizations can be said to be imperfectly (at best) realized, if not substantively absent.

Moreover, the challenge of defining who the audience is in an act of macrosecuritization remains problematic. While Buzan and Wæver's work would suggest that states

are the audience, the theory also allows for lower tiers to be subsumed into the process. At the same time, the theory allows for contending lower-tier political or securitization agendas to exert bottom-up pressure on the process. Hence, the notion of audience needs to be unpacked. As our case study highlights, even as the Chinese state has supported the macrosecuritization of AMR, subnational and individual-level actors have ignored (partially or completely) the resulting national directives. As we have shown, this lower-tier resistance has come about due to contending political and resource competitions within the state. A question that arises beyond the scope of this article is: To what extent does the emergency distribution of resources during securitization validate the act itself? In this article, we have identified a negative case—where the insufficient distribution of emergency resources weakens audience acceptance and thus the domestic securitization of AMR and, as a consequence, the macrosecuritization of AMR.

The role of science in policy making in China also comes under question. As we note in reference to the MOHNARIN network, funds the state has made available are insufficient to operate a truly national surveillance program despite claims to the contrary. While there is also the CHINET network of sentinel hospitals and laboratories as well as closed WeChat networks for clinicians and infectious disease researchers, these also have gaps. Moreover, there is no sense of integration between these different capacities. This leads to a patchwork approach to AMR, in particular, and to infectious disease surveillance, more generally. Such a result is at odds with China's image as a centralized state that can implement core directives as needed. Even in the age of Xi Jinping's China Dream, the provinces and lower-tier public health agencies and institutions are able to disregard or imperfectly implement policies and practices when this suits their needs.

The resource shortfall for basic surveillance further means that the presence of either catalytic or topical funding creates a powerful incentive for public health researchers to reorient their efforts toward the new funding agenda. This implicitly creates a highly competitive environment wherein support for funded activities denotes continued access to resources. In the case of China, when the state does not supply sufficient funding, external health agencies and foundations can do so. However, as noted above, competition generated by resource scarcities can create a perversely competitive environment wherein even viral samples are not shared between local hospitals because when a host hospital runs an analysis it creates a basis for that hospital to seek additional funding for training and equipment.

7 This conclusion echoes Nunes' (2015) call for a better understanding of politics leading to the securitization act, although our idea was fully formed before we became aware of Nunes' work. It also partially mirrors Bigo's (2002, 72) observation that "the security process itself is the result of mobilization of the work of political discourses."

Again, this is by no means a situation unique to China. As Elbe (2010) demonstrated with reference to H5N1 in Indonesia, the physical control of such samples can be leveraged by states to gain access to additional financial, human, or pharmaceutical resources. In resource-constrained countries, such as China and Indonesia, competition is more severe because resources are scarcer. Equally, in Vietnam, the state simply manages disease control, preferring not to expend scarce resources on their elimination and only taking action when human lives are threatened or when the issue attracts international attention (Interview J 2017). This, in turn, means that external donors can affect local public health priorities disproportionate to the actual needs of the recipient state and society.

This raises quite fundamental questions regarding the priorities of Chinese public health policy-setting behaviors. China has been the source of two major infectious disease outbreaks (SARS and H5N1) and of the emergence of the MCR-1 gene. The reality of overlapping living spaces between humans and animals at a time when new ecosystems are continually exposed to physical infrastructure projects means that it is inevitable that novel zoonotic diseases with cross-species potential will emerge in China. This means that it is simply good policy to address the threat posed by AMR. However, it only works if the lower tiers of the Chinese nation-state are able and willing to commit resources in pursuit of this agenda.

Throughout this article, we have argued that the health security threat posed by AMR in China is real but that the securitizing act is not designed to directly address the issue as an existential threat. Instead, the Chinese national authorities are using the issue to foster the creation of an enforceable policy framework that privileges the policy-making center at the expense of subnational authorities. In other words, as Wæver (2011, 474) put it, undertaking the securitization for “other reasonings than threat or necessity.” This politicized—rather than securitized—perception of AMR is what allows policy space for competing health or economic agendas to be advanced at the lower tiers. It is only when this competition is mitigated or realigned that China can be said to be truly supportive of the macrosecuritization of AMR.

Interviews

Interview A: Senior Chinese AMR scientist, Hangzhou, Zhejiang, January 2017.

Interview B: Chinese public health academic, Beijing, December 2016.

Interview C: Senior officer in an international financial institution, Washington, DC, June 2017.

Interview D: Global public health researchers, Washington, DC, June 2017.

Interview E: A Chinese chicken and pig farmer, Guangdong province, June 2017.

Interview F: Head of a Chinese microbiology lab, Beijing, December 2016.

Interview G: Director of a U.S. health-related agency, Beijing, December 2016.

Interview H: Senior U.S. aid-related agency official and team members, Washington, DC, June, 2017.

Interview I: U.S. multi-agency health personnel, Beijing, December 2016.

Interview J: International public health researchers, Bangkok, Thailand, January 2017.

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